WHAT IS CLAIMED IS

1. A polarization independent optical switch, comprising:

spaced apart transparent plates, said plates having conductors thereat;

a liquid crystal layer sandwiched between said two plates and having a photopolymer dispersed therein;

a diffraction grating formed within said liquid crystal layer and having a predetermined spatial frequency; and,

a voltage selectively applied across said plates to erase said grating such that an impinging light beam either passes through said switch having its exit direction offset in accordance with the spatial frequency of said grating so as to exit at a predetermined exit point or has its exit direction unaltered by said switch such that said light beam exits at a different exit point, thus to switch said incoming beam between two exit points.

2. The optical switch of Claim 1, wherein each set of plates constitutes a cell, and further including means for mounting said cells together such that said light beam passes through each of said cells, the exit point of said beam determined by which of said cells has said voltage applied there across.

3. The optical switch of Claim 2, wherein one cell has a liquid crystal layer with a diffraction grating having a spatial frequency different from that of another of said cells thus to be able to vary the exit point associated with the diffraction grating of a cell to further control the exit point of said impinging beam.

4. The optical switch of Claim 1, wherein said impinging beam is a monochromatic light beam.

5. The optical switch of Claim 4, wherein said beam is plane polarized.

6. The optical switch of Claim 6, wherein said grating is formed by two interacting laser beams.

7. The optical switch of Claim 1, wherein said interacting laser beams are plane polarized.

8. A method of selectively switching a light beam from one position to another without the use of polarization, comprising the steps of:

passing the light beam through a photopolymer dispersed liquid crystal layer, said layer having a diffraction grating embedded therein; and,

applying a voltage across the liquid crystal layer to erase the grating, whereby the light beam is diffracted or not depending on the presence or absence of the grating, thus to perform a switching function.

9. The method of Claim 8, wherein the layer includes a photopolymer, liquid crystal, a dye, an acrylate oligomer and an acrylated urethane.

10. The method of Claim 9, wherein the layer is sandwiched between two transparent plates.

11. The method of Claim 10, wherein said plates are coated with electrically conductive material.

12. The method of Claim 10, wherein said plates have electrical conductors thereat.

13. The method of Claim 8, wherein the layer is between 3 and 15 microns in thickness.

14. The method of Claim 8, wherein the grating includes interference fringes.

15. The method of Claim 14, wherein the interference fringes are formed by holography.

16. The method of Claim 14, wherein the interference fringes result in a lens focusing the light beam to a point and wherein the application of the voltage causes defocusing of the beam.